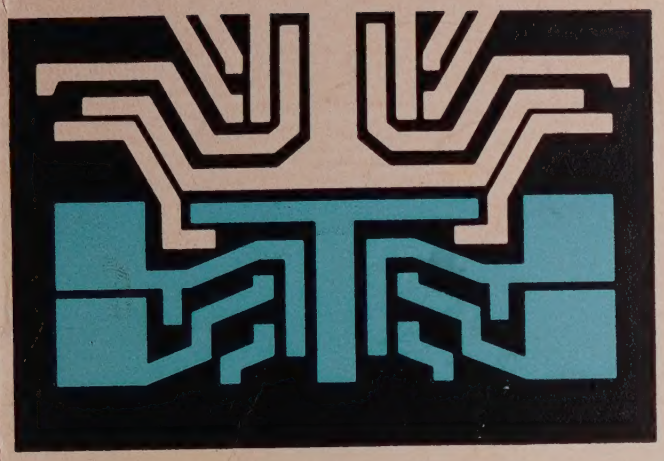
03M04A68



the BIRTCHER CORPORATION

INSTRUMENT DIVISION

1200 MONTEREY PASS ROAD / MONTEREY PARK, CALIFORNIA 91754 / TELEPHONE (213) 264-6

THE BIRTCHER CORPORATION
INSTRUMENT DIVISION
1200 MONTEREY PASS ROAD / MONTEREY PARK, CALIFORNIA 91754 / PHONE (213) 264-6610

March 27, 1967

Magnavox Corporation
2131 Bueter Road
Ft. Wayne, Indiana

Attn: H. Frebel

Re: Your Purchase Order No. 28258GFR

Dear Sir:

Birtcher recently supplied your facility with the instruction manuals for your Model 800 Integrated Circuit Test Set. At that time we were "out of stock" on the proper covers for these manuals.

We therefore are enclosing at this time the three-ring binders for the manuals. The reason for our utilization of these binders, is that we will be providing application notes, and possibly additional modules in the future. These binders permit your calibration department to maintain all pertinent information in one central location.

We hope that your Birtcher equipment is performing satisfactorily. Please let me know if Birtcher can be of further service.

Very truly yours,

THE BIRTCHER CORPORATION/INSTRUMENT DIVISION

Bob Prosin, Sales Manager

BP:th

MODEL 800

INTEGRATED CIRCUIT

TEST SET - BASIC UNIT

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https://archive.org/details/manualsplus_12718

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Unit Serial Number_____

SECTION 1

GENERAL DESCRIPTION

INTRODUCTION

The Model 800 Integrated Circuit Test System is an extremely versatile instrument for testing of integrated circuit and semiconductor devices, composed of a Model 800 Basic Unit with a wide range of building block modules.

The minimum system, composed of Power Supply, Readout and Matrix Modules, permits testing of DC integrated circuit parameters. This system allows for rapid testing of "functional" parameters as well as complete specification measurement.

With the addition of the Pulse Generator Module and external oscilloscope, dynamic tests of digital integrated circuits can be made. Using a function generator, linear IC parameters can be monitored on the oscilloscope.

Optional resistor and capacitor Decade Module provides convenient switching of loading and feedback networks on digital and linear IC's.

SPECIFICATIONS

NOTE: All specifications given in this section pertain only to the Model 800 basic frame itself; specifications on the individual modules are provided as separate documents to this manual.

AC Power Requirements:

115/230 VAC 50/60 CPS

Internal DC Power Supply:

24 Volts DC at 1 Amp

Size:

25" high x 19½" wide x 13" deep
(Accomodates standard 19" panels).

Weight:

25 pounds

SECTION 2

OPERATION

GENERAL

This section refers to the Model 800 basic frame only. Operating procedures for the modules contained in the 800 are explained in the respective manual inserted as an addendum to this manual.

INSTALLATION

After unpacking and setting upright, the rear panel of the basic frame should be removed and the connectors checked to assure proper insertion.

The Model 800 is supplied with an AC line cord "parallel ground adapter". The unit will operate ungrounded although AC line noise may cause errors in low level measurements on the 821 Readout.

FUNCTION OF SWITCHES

POWER Switch

Interrupts the AC line voltage.

TEST Switch

Applies 24 volts DC to modules when depressed.

VOLTAGE SELECTION Switch

Located on rear of keyboard, switches internal supplies for 115 or 230 VAC operation.

SECTION 3

MAINTENANCE

INSTRUCTION MANUAL

A Birtcher Instruction Manual usually contains hand-made changes to diagrams and parts lists, and, sometimes, texts. These changes are generally appropriate only to the instrument for which the manual was prepared. These hand-made corrections show changes to the instrument which were made after the printing of the manual. There is a serial number on the Table of Contents Page of this manual. This is the serial number of the instrument to which this manual belongs.

NOTE: Always include the instrument type and serial number in any correspondence regarding the instrument.

REPLACEMENT PARTS

Standard Components

Birtcher will supply replacement components at current net prices. However, since most of the components are standard electronic and radio parts, many times they may be obtained locally faster than from the factory. Consult the parts list to see what tolerances are required.

Selected Components

Components whose values must fall within prescribed limits may have been selected from our regular stock. The components so selected will have standard RETMA color coding showing the value and tolerance of the stock from which they were selected; they will not, in general, be replaceable from dealer stock.

Birtcher Manufactured Parts

Birtcher manufactures almost all of the mechanical parts and some of the components used in the instrument. If you order a mechanical part, be sure to describe the part completely to prevent any unnecessary delay in filling your order. When you have any questions about mechanical parts or Birtcher manufactured components, contact our nearest field sales representative or write to the service department at the factory in Monterey Park, California.

SPARE PARTS KITS

Spare parts are available in kit form. "Field Replacement Spares", contain pilot lamps, fuses, etc. "Isolated Service Spares" contains parts less likely to fail during normal useage but which would place the unit out of service if unavailable. These two kits are itemized in the parts list as accessory items.

REMOVAL AND REPLACEMENT OF PARTS

The procedures required for replacement of most parts in the Model 800 are obvious. Detailed instructions for their removal are not required. Other parts, however, can be best removed if a definite procedure is followed. Instructions for the removal of some of these parts are contained in the following paragraphs.

Replacement of Switches

Methods of removal of defective switches are, for the most part, obvious and only a normal amount of care is required. Single wafers are normally not replaced on the switches used in the Model 800; and if one wafer is defective, the entire switch should be replaced. Switches may be ordered from Birtcher either wired or unwired, as desired.

Replacement of PC Board Components

Some components in the program cards are mounted on a printed circuit board. To avoid damage to the PC board when replacing components, the following precautions should be observed.

Use a low power soldering iron (50 Watt maximum).

Use only a high quality rosin core solder, NEVER A PASTE FLUX. After soldering, clean off any excess flux.

When replacing components with multiple mounting pins, such as tube sockets, transistors, potentiometers, etc., it will be necessary to lift each pin slightly, working around the components several times until it is free.

CALIBRATION

The Model 800 Basic Unit requires no calibration. Calibration of Module is outlined in the Module Manual.

SECTION 4

PARTS LIST

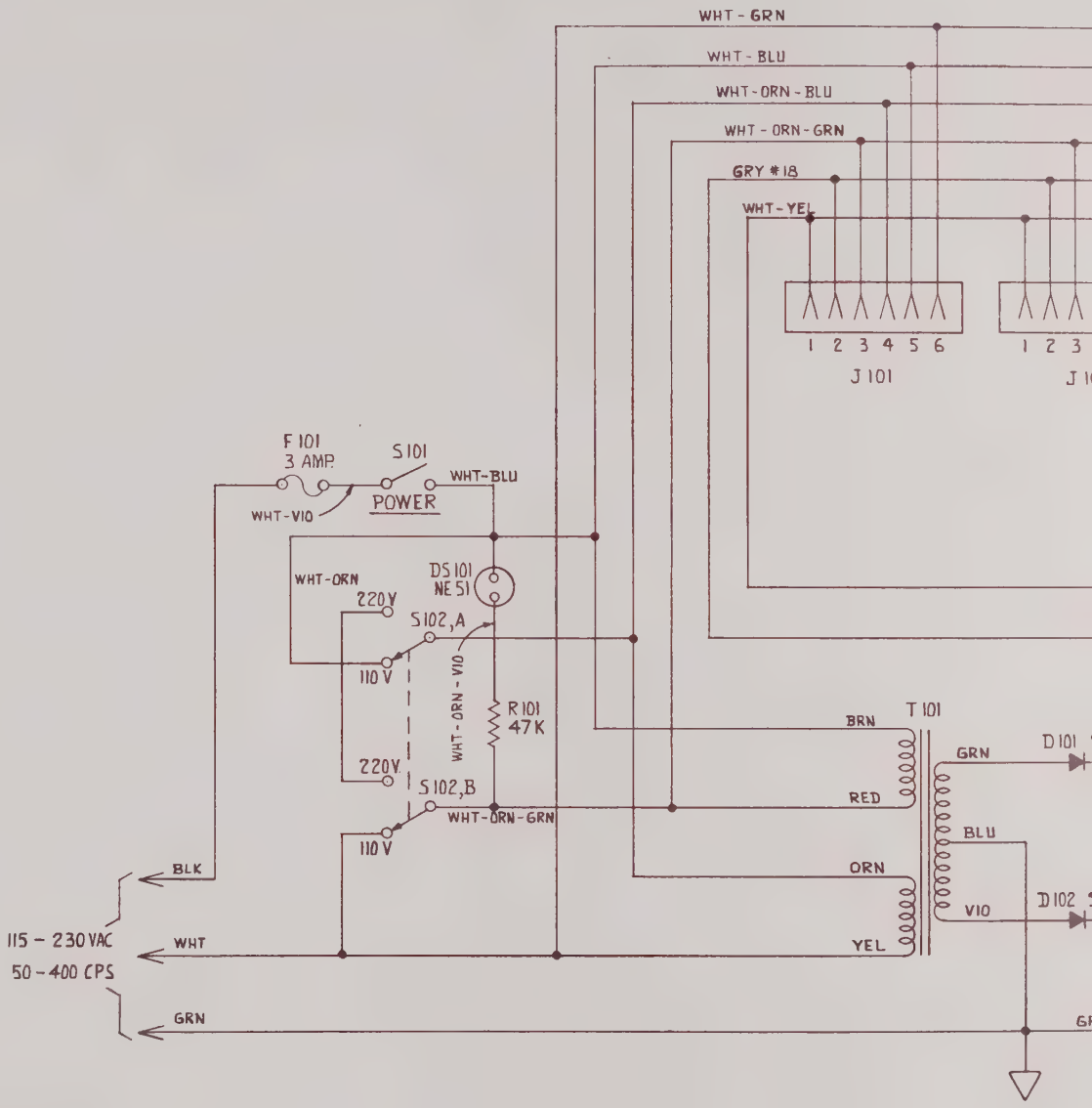
REFERENCE	DESCRIPTION	PART NO.
CAPACITORS		
C101	4000 ufd @ 40W vdc	41019
DIODES		
D101	1 amp - 100 piv	40553
D102	1 amp - 100 piv	40553
LAMPS		
SD101	NE-51H	40416
FUSES		
F101	3A, 3AG slo-blo	40407
RESISTORS		
R101	47K ohm .5W ± 10%	40214
R102	470 ohm 2W ± 10%	41018
SWITCHES		
S101	SPST Rocker	40572
S102	SPST Momentary Rocker	40573
S103	DPDT Slide	40571
TRANSFORMERS		
T101	Power	40903

FIELD REPLACEMENT SPARES KIT 20029

1	40416	Lamp, Pilot NE-51H
5	40407	Fuse, 3A, 3AG slo-blo

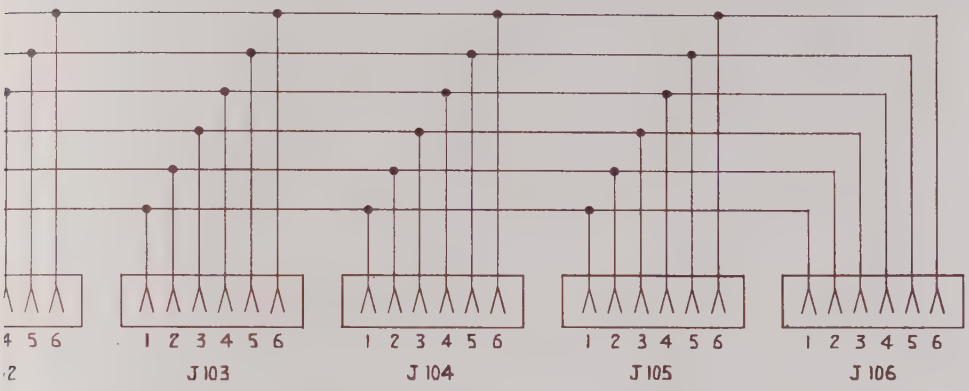
ISOLATED SERVICE SPARES 20030

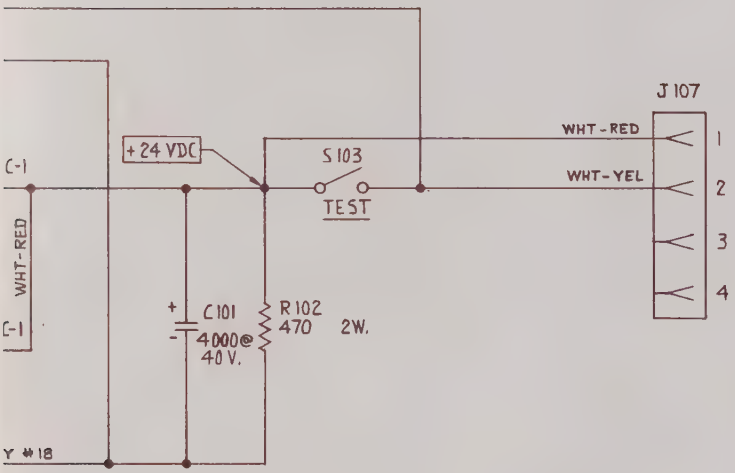
1	41019	Capacitor, Electr. 4000 ufd @ 40W vdc
2	40553	Diode, Rectifier 1 amp - 100 piv
1	40416	Lamp, Pilot Neon NE-51H
5	40407	Fuse, 3A, 3AG, slo-blo
1	40214	Resistor 47K ohm .5W ± 10%
1	41018	Resistor 470 ohm 2W ± 10%
1	40572	Switch SPST Rocker
1	40573	Switch SPST Momentary Rocker
1	40571	Switch DPDT Slide
1	40903	Transformer, power



3. UNDERLINED CONTROL DESIGNATIONS APPEAR ON FRONT PANEL.
2. CAPACITANCES IN μfd.
1. RESISTORS, ½ W., ± 10%, CARBON.

NOTES: UNLESS OTHERWISE SPECIFIED.





THE BIRTCHER CORP. — INSTRUMENT DIVISION			
SCHEMATIC INTEGRATED CIRCUIT TEST SET BASIC UNIT, MODEL 800			
DRAWN: E. Bodeman.	APP'D: RLM	DWG. NO. C1269	REV.
DATE: 12-7-66	DATE: 12-1-66		

WARRANTY

All our products are warranted against defects in materials and workmanship for one year from the date of shipment. Our obligation is limited to repairing or replacing parts which prove to be defective during the warranty period. We are not liable for consequential damage.

For assistance of any kind, including help with instruments under warranty, contact your authorized Birtcher sales representative for instructions. Give full details of the difficulty and include the instrument model and serial number. Service data or shipping instructions will be promptly sent to you. There will be no charge for repair of instruments under warranty, except transportation charges. Estimates of charges for non-warranty or other service work will always be supplied if requested before work begins.

M O D E L

821

READOUT MODULE

TABLE OF CONTENTS

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Unit Serial Number_____

SECTION 1

GENERAL DESCRIPTION

INTRODUCTION

The 821 Readout Module is used with the Birtcher 800 component test system to provide flexible and convenient measurement of DC voltages and currents for component testing.

The 821 is a high input impedance chopper stabilized voltmeter with input and range switching. The unit is contained in a single package compatible with the Model 800 test system.

SPECIFICATION

Voltage Ranges:

0.1, 0.3, 1, 3, 10, 30, 100

Current Ranges:

1, 3, 10, 30, 100, 300 microamperes
1, 3, 10, 30, 100 milliamperes

Accuracy:

± ½% of full scale indication, ± ½% of reading

Dimensions:

19" wide x 3½" high x 6½" deep

Construction:

Aluminum alloy chassis, anodized aluminum front panel with silk screen markings

Weight:

5 pounds

SECTION 2

OPERATION

INSTALLATION

1. Unpack the Module and check it for damage. The chopper should be seated fully and squarely in the socket and the clamp fastened.

2. Remove the back cover of the Model 800. Install the Readout Module just above the matrix panel.

3. Insert the six pin cable connector into one of the six pin receptacles on the upper back of the keyboard frame.

4. Insert the twelve pin cable connector into the twelve pin "Readout" receptacle on the Matrix Module. Insert the twelve pin cable connector on the Matrix Module into the twelve pin receptacle on the Readout Module.

FUNCTION OF CONTROLS AND METERS

RANGE SWITCH

Eighteen position rotary switch selects any of eleven current ranges or seven voltage ranges.

FUNCTION SWITCH

Eleven position rotary switch provides selection of any power supply line or external line.

POLARITY SWITCH

Two position lever switch changes the polarity of the meter movement with respect to the amplifier output.

METER

Taut-band 50 microampere, dual scale, mirror backed meter; indicated current flowing in power supply or external lines, or voltages from lines to common. Ranges are selected by the RANGE SWITCH.

MEASUREMENTS

1. Set the FUNCTION switch to Matrix line to be measured.

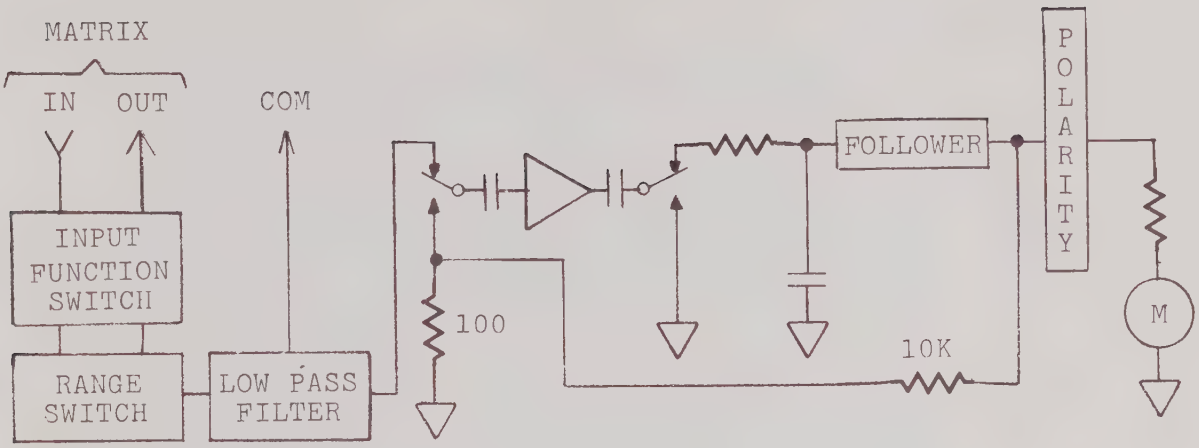
2. Set RANGE switch to selected Voltage or Current range. NOTE: Voltage measurements are made with respect to matrix common. Current measurements are made in series with matrix input leads. On external measuring lines, currents may be measured to ground by shorting input to ground on matrix panel.

3. Set the POLARITY switch for proper readout indication. NOTE: On current measurements the polarity switch indicates the polarity of current flowing into the matrix from power supply or external inputs. Current flow from the matrix is indicated opposite its actual polarity.

4. Read voltage and current on meter.

SECTION 3

THEORY OF OPERATION



BLOCK DIAGRAM

FIGURE 3

The FUNCTION switch places the meter between any one of the Matrix input lines and common on the voltage measurement. The meter thus measures this line to common voltage. On current measurements this switch places current shunt resistors in series with the desired line.

The RANGE switch selects taps on a precision constant impedance voltage divider between the measured line and circuit common on voltage measurements. On current measurements the switch selected shunt values placed in series with measured line.

Voltages from the RANGE switch are filtered and amplified by a chopper stabilized solid state amplifier. Gain stability is achieved by negative feedback. Output from the amplifier is applied through POLARITY switch to meter.

Extreme isolation required for "floating" current measurements is attained through the use of a triple box shielded transformer in meter power supply.

SECTION 4

MAINTENANCE

GENERAL

Instructions for General Maintenance, Removal and Replacement of Parts, and Parts Ordering are included in the Model 800 Section of this manual.

CALIBRATION

Calibration Cycle

The recommended calibration cycle is six months.

The TYPE 821 is a stable instrument and should not require frequent calibration. However, it will be necessary to calibrate certain parts of the instrument when components are changed. Also, a periodic calibration is desireable from the standpoint of preventive maintenance.

In the instructions that follow, the steps are arranged in the proper sequence for full calibration. Each numbered step contains the information necessary to make one adjustment. If a complete calibration is not necessary, you may perform individual steps.

Equipment Required:

1. DC Voltmeter, Digital or Differential with .1% accuracy.

2. Precision Power Supply - 0 to 100 volts- uncalibrated. (The Birtcher 826 Power Supply Module may be used).

3. Birtcher 800 Integrated Circuit Test Set Basic Unit with 830/831 Matrix Module.

NOTE: Any input voltage supply contained in the Birtcher 826 Power Supply Module may be used by selecting on Readout Function Switch.

Mechanical Zero

1. Remove the meter movement from the amplifier circuit by placing the polarity switch between positions.
2. Adjust meter for zero using mechanical adjustment.

Electrical Zero

1. Connect the 821 to the Model 800 and Matrix (830/831) Modules as outlined in installation.
2. If external Power Supply is used, connect the matrix.
3. Turn Model 800 power ON.
4. Place FUNCTION switch in OFF position.
5. Place RANGE switch in 100 ma position.
6. Adjust trimmer located near top center of amplifier PC board for zero indication on meter. The meter should not move when Polarity switch is changed from plus to minus position.

Full Scale Adjustment

1. Connect precision voltmeter across power supply.
2. Set RANGE switch to 10V range.
3. Set FUNCTION switch to Matrix line power supply is connected to.
4. Turn power supply ON (when using 826 depress test switch).
5. Adjust power supply for 10V indication on external meter.
6. Adjust meter for F.S. indication with calibration trimmer located on lower right side of amplifier PC board.

SECTION 5

PARTS LIST

REFERENCE	DESCRIPTION	PART NO.
CAPACITORS		
C101	500 MFD @ 50V	41022
C102	500 MFD @ 50V	41022
C103	20 MFD @ 25V	40395
C104	0.22 MFD @ 200V	41023
C105	0.1 MFD @ 500V	40386
C106	5 MFD @ 500V	
C107	820 PFD @ 1000V	40033
C108	0.1 MFD @ 500V	40386
C109	5 MFD @ 12V	40394
C110	0.1 MFD @ 500V	40386
C111	5 MFD @ 12V	40394
C112	0.1 MFD @ 500V	41088
C113	820 PFD @ 1000V	40033
C114	0.1 MFD @ 100V	40398
C115	0.1 MFD @ 100V	40398
C116	0.1 MFD @ 100V	40398
CHOPPERS		
X101	DPDT JAMES 2341	40397
DIODES		
D101	Bridge Rectifier 1A 50V	40556
D102	20V Zener 1N4747	40558
D103	20V Zener 1N4747	40558
METERS		
M101	Taut Band, Mirror Scale	40978
RESISTORS		
R101	4.7K ohm ½W 10%	40429
R102	4.7K ohm ½W 10%	40429
R103	680 ohm ½W 10%	40195
R104	680 ohm ½W 10%	40195
R105	10K ohm ½W 10%	40186
R106	18K ohm ½W 0.5%	40446
R107	1K Trim Pot ¼W 5%	40447
R108	10K ohm ½W 10%	40186
R109	4.7 Megohm ½W 10%	40444
R110	1K Trim Pot ¼W 5%	40447
R111	2.2K ohm ½W 10%	40199
R112	100K ohm ½W 10%	40438
R113	180K ohm ½W 10%	40440

SECTION 5

PARTS LIST (continued)

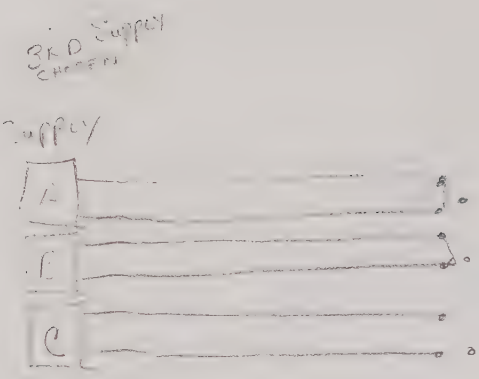
REFERENCE	DESCRIPTION	PART NO.
R114	1 Megohm ½W 10%	40442
R115	100K ohm ½W 10%	40438
R116	180K ohm ½W 10%	40440
R117	1 Megohm ½W 10%	40442
R118	100K ohm ½W 10%	40438
R119	180K ohm ½W 10%	40440
R120	1 Megohm ½W 10%	40442
R121	9.5K ohm ½W 0.5%	40445
R122	10K ohm ½W 10%	40186
R123	10K ohm ½W 10%	40186
R124	100 ohm ½W 0.5%	41024
R125	10K ohm ½W 0.5%	40330
R126	0.100 ohm ½W 0.5%	40358
R127	0.333 ohm ½W 0.5%	40355
R128	1.0 ohm ½W 0.5%	40356
R129	3.33 ohm ½W 0.5%	40357
R130	10.0 ohm ½W 0.5%	40258
R131	33.5 ohm ½W 0.5%	40261
R132	101 ohm ½W 0.5%	40266
R133	345 ohm ½W 0.5%	41093
R134	1.11K ohm ½W 0.5%	40278
R135	5K ohm ½W 0.5%	40284
R136	9 Megohm ½W 1%	41025
R137	666K ohm ½W 0.5%	40322
R138	233K ohm ½W 0.5%	40315
R139	66.6K ohm ½W 0.5%	40304
R140	23.3K ohm ½W 0.5%	40296
R141	6.66K ohm ½W 0.5%	40286
R142	3.33K ohm ½W 0.5%	40281
R143	1K ohm ½W 0.5%	40331
SWITCHES		
S101	Function, Rotary	40912
S102	Range, Rotary	~~40912~~
S103	DPDT Lever	40569
	range switch without plate	40911
TRANSFORMERS		
T101	Power, Triple Box Shield	40907
TRANSISTORS		
Q101	Field Effect 2N 3819	41027
Q102	Field Effect 2N 3819	41027
Q103	Field Effect 2N 3819	41027
Q104	Field Effect 2N 3819	41027

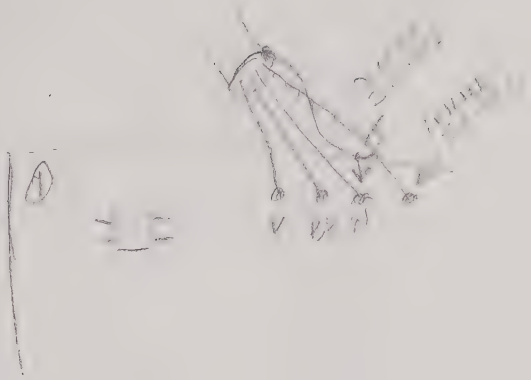
SECTION 5

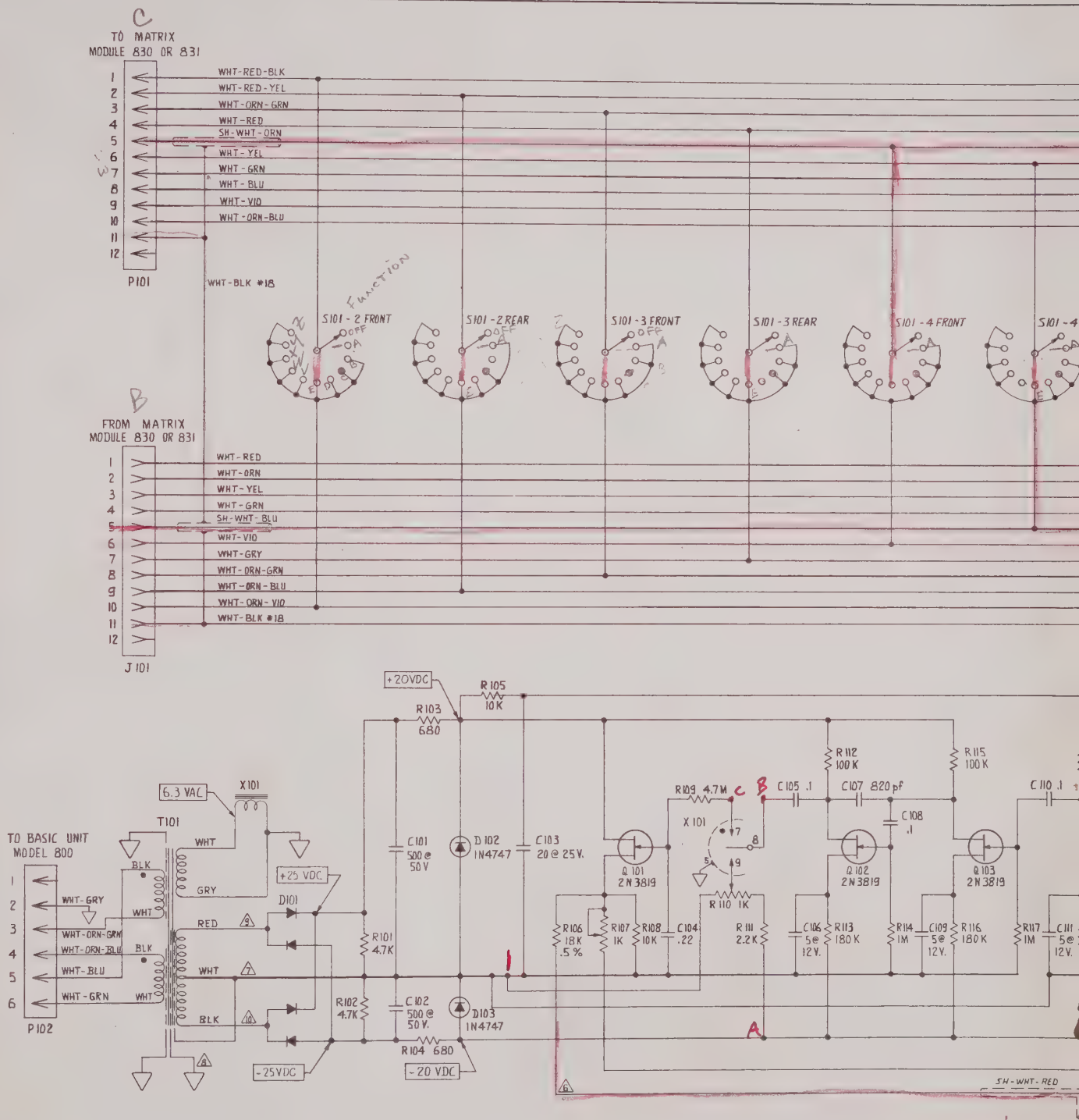
PARTS LIST (continued)

REFERENCE		DESCRIPTION	PART NO.
FIELD REPLACEMENT SPARES KIT			20027
1	40397	Chopper, DPDT James 2341	
1	40978	Meter, Taut-band, Mirror Scale	
ISOLATED SERVICE SPARES KIT			20028
1	40397	Chopper, DPDT James 2341	
1	40978	Meter, Taut-band, Mirror Scale	
1	30002	Rotary Switch, Range with parts	
1	40912	Rotary Switch, Function	
1	40569	DPDT Lever Switch	
1	40907	Power Transformer	

30002 range switch with parts
40911 " " no "


3 K D Supply
Supply
A
B
C



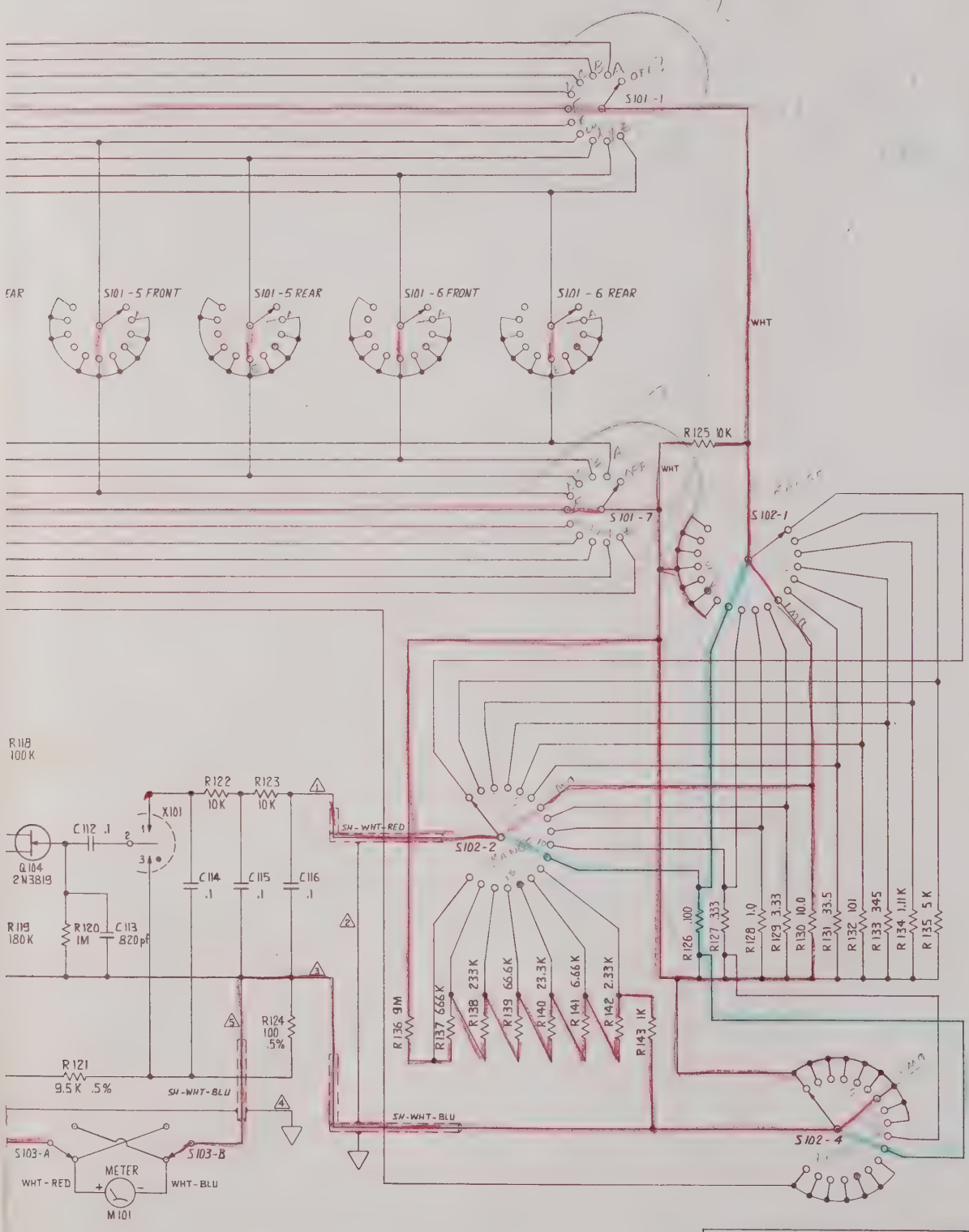


7 P.C. BOARD TERMINALS ARE SHOWN △
6. LAST NUMBERS ARE R143 & C116
5. SHIELDS GROUNDED.
4 ROTARY SWITCHES SHOWN IN MOST CCW POSITION.
3. ALL CAPACITANCES IN μfd.
2. ALL RESISTANCES IN OHMS.
1. RESISTORS, ½ W., 10% CARBON

NOTES: UNLESS OTHERWISE SPECIFIED.

FRONT PANEL CONTROLS & METER

S 101	FUNCTION SWITCH.
S 102	CURRENT & VOLTAGE RANGE SWITCH.
S 103	POLARITY SWITCH.
M 101	METER



THE BIRTCHER CORP. —— INSTRUMENT DIVISION

SCHEMATIC

READOUT

MODULE 821

DRAWN: E. Bodeman.	APP'D: RLM	DWG. NO. D1270	REV.
DATE: 12-9-66	DATE: 12-1-66		

WARRANTY

All our products are warranted against defects in materials and workmanship for one year from the date of shipment. Our obligation is limited to repairing or replacing parts which prove to be defective during the warranty period. We are not liable for consequential damage.

For assistance of any kind, including help with instruments under warranty, contact your authorized Birtcher sales representative for instructions. Give full details of the difficulty and include the instrument model and serial number. Service data or shipping instructions will be promptly sent to you. There will be no charge for repair of instruments under warranty, except transportation charges. Estimates of charges for non-warranty or other service work will always be supplied if requested before work begins.

M O D E L

826

POWER SUPPLY

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Unit Serial Number_____

SECTION 1

GENERAL DESCRIPTION

INTRODUCTION

The 826 Power Supply Module is used with Birtcher Model 800 component test system to provide bias voltages and currents for testing integrated circuit and semiconductor components.

The Model 826 contains five power supplies, four with constant voltage outputs and one with constant current output. The voltage supplies have internal current limiting; a front panel lamp for each supply indicates when an overload condition exists. The current supply is unique in that regulation is maintained with positive or negative 10V output, allowing its use as a dynamic current load.

SPECIFICATIONS

Voltage Supplies: A, B, C, and D

Output Ranges: ± 0-1, 10, 100 volts
Output Current: 50 ma maximum
Accuracy of Output Setting: ± 0.25%
Stability Line and Load at Matrix: 0.1% +5 mv
Output Ripple Voltage: 1×10^{-5} V rms of output range

Current Supply: E

Output Ranges: ± 0-100 microamperes
± 0-1, 10, 100 milliamperes
Output Compliance Voltage: ± 10 volts
Accuracy of Output Setting: ± 0.25% + 1 ua
Stability Line and Load: ± 0.1%
Output Ripple Current: 1×10^{-5} of full scale.

Dimensions:

19" wide x 5¼" high x 6½" deep

Construction:

Anodized aluminum panel and chassis, silk screened front panel markings.

Weight:

13 pounds

Power Requirements:

115/230 VAC, 50/60 CPS
(Power obtained from Model 800 Basic Unit).

SECTION 2

OPERATION

GENERAL

The Digital Power Supply Module has been designed such that the front panel markings are self explanatory.

The five power supplies are connected internally to the left hand set of five jumpered banana jacks on the Matrix panel labeled A through E. Through the jumpers, the power supplies are connected to the top five rows of the matrix switch.

INSTALLATION

1. Remove the back cover of the Model 800. Install the Power Supply Module at the top of the panel opening.

2. Insert the six pin cable connector into a six pin receptacle on the upper back of the keyboard frame.

3. Insert the eight pin cable connector from the Matrix Module into the eight pin receptacle on the power supply.

FUNCTION OF CONTROLS

RANGE SWITCH-VOLTAGE SUPPLY

Three position rotary switch selects the maximum value of supply output.

RANGE SWITCH-CURRENT SUPPLY

Four position rotary switch selects the maximum value of supply output.

POLARITY SWITCH

Selects a positive or negative output from the supply.

FUNCTION OF CONTROLS

DIGITAL DIAL

Three digit decade dial establishes the output of the supply. Full scale output selected on RANGE switch.

CURRENT LIMITING LAMP

Indicates that voltage supply is current limiting due to overload.

TEST BIASING

1. Set the POLARITY switch for proper output polarity.
2. Set RANGE switch for desired output range.
3. Set DIGITAL output adjust controls for output voltage or current. (Full clockwise adjustment is voltage selected by supply range switch, i.e.: indication of 7 1 2 with Range switch on 10 volts would be 7.12 volts output).
4. Depress TEST switch for output.

SECTION 3

THEORY OF OPERATION

VOLTAGE SUPPLY

Input power to the 826 is supplied from the Model 800 basic unit. Power transformers in the 826 have double primaries allowing operation at 115 or 230 VAC line. Proper primary connections are made in the Model 800

The voltage power supplies in the 826 have an output section and a control section as the block diagram indicates. Power for both sections is derived from the common power transformer.

The reference voltage is obtained from a low TC zener diode. Current to the diode is regulated to reduce the effects of line voltage changes. Regulated reference voltage is applied across a ten turn precision potentiometer. A three digit decade dial is used to set the voltage at the wiper of the potentiometer.

On voltage supplies output voltage is sensed by a precision voltage divider placed across the output of the power supply. On the current supply a precision resistor is placed in series with the low side of the supply output.

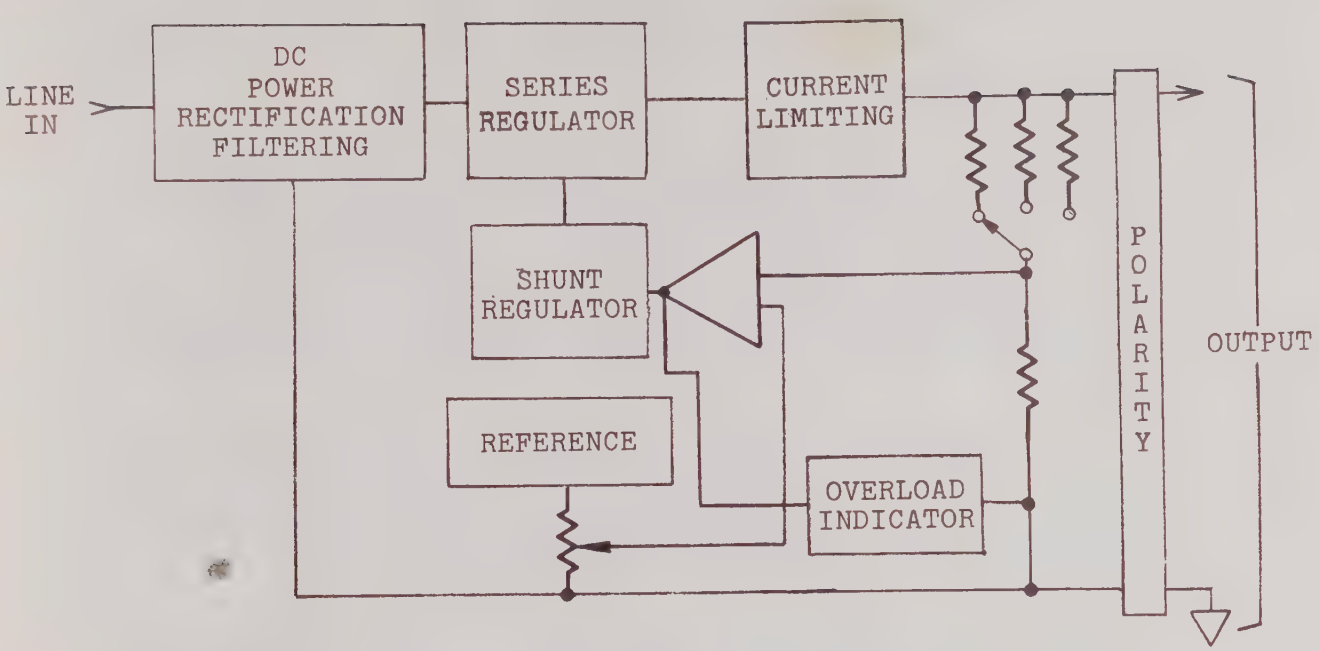
Values of divider and current sensing resistors are chosen for 1V comparison signal for full output on any range.

The wiper of the precision potentiometer and the sensed output are applied to the two inputs of an operational amplifier. This amplifier drives a shunt regulator which in turn drives the output series regulator.

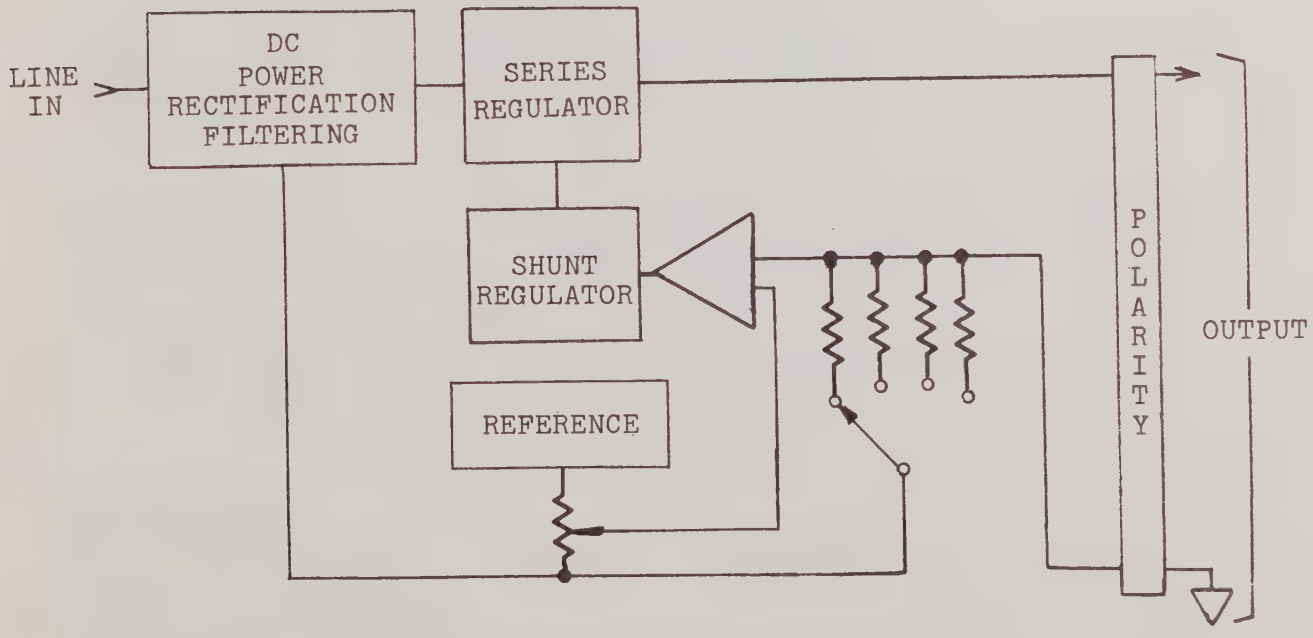
Current limiting on voltage supplies is obtained by passing output through a 100 ohm resistor with a 5.6 volt zener diode from supply output to the base of the series transistor. This causes the series transistor to current limit when approximately 5V is developed across 100 ohm resistor.

Current limit indication is provided by pilot lamp. This lamp is turned on when amplifier senses low output voltage.

VOLTAGE SUPPLY



CURRENT SUPPLY



SUPPLY BLOCK DIAGRAM

FIGURE 3

SECTION 4

MAINTENANCE/CALIBRATION

GENERAL

Instructions for General Maintenance, Removal and Replacement of Parts and Parts Ordering are included in the Model 800 section of this manual.

CALIBRATION

Calibration Cycle

Recommended calibration cycle is six months.

The Type 826 is a stable instrument and should not require frequent calibration. However, it will be necessary to calibrate certain parts of the instrument when components are changed. Also, a periodic calibration is desireable from the standpoint of preventive maintenance.

In the instructions that follow, the steps are arranged in the proper sequence for full calibration. Each numbered step contains the information necessary to make one adjustment. If a complete calibration is not necessary, you may perform individual steps.

Equipment Required:

1. Precision DC Voltmeter, Digital or Differential with 0.1% accuracy.

2. Resistors: 10K .1%

3. Model 800 Basic Unit with 830/831 Matrix Module.

Preliminary

1. Set the voltage supplies to the 10V range. Set the current supply to the 1 ma range.

2. Set all of the polarity switches to plus.

3. Place a 10K ohm 10% resistor across the input terminals of the DC voltmeter. Connect the "A" and "COMMON" jacks on the matrix panel to the voltmeter.

Zero Adjustment

1. Set the Digital dial to full counter clockwise 000 (minimum output).
2. Depress TEST Switch.
3. Adjust POWER SUPPLY zero trimmer,(located on bracket at top front of supply) for less than ± 10 mv indication on external meter.
4. Repeat for all power supplies.

Output Adjustment

1. Set the Digital dial to full clockwise 000 (maximum output).
2. Depress the TEST Switch.
3. Adjust power supply reference located on lower center of power supply PC board for 10V ± 10 mv.
4. Repeat for all power supplies.

SECTION 5

PARTS LIST

REFERENCE	DESCRIPTION	PART NO.
CAPACITORS		
C101	300 MFD @ 150V	40392
C102	500 MFD @ 25V	40061
C103	500 MFD @ 25V	40061
C104	200 MFD @ 1000V	40384
C105	0.005 MFD @ 1000V	40387
C106	100 PFD @ 1000V	40385
C107	100 PFD @ 1000V	40385
C201	1000 MFD @ 25V	40393
C202	500 MFD @ 25V	40061
C203	0.001 MFD @ 1000V	40031
C204	0.005 MFD @ 1000V	40387
C205	100 PFD @ 1000V	40385
C206	0.015 MFD @ 600V	40030
DIODES		
D101	Full Wave Rect. 1A 300V	40557
D102	Bridge Rectifier 1A 50V	40556
D103	6.5V Zener 1N823	40554
D104	5.6V Zener 1N4734	40555
D201	Bridge Rectifier 1A 50V	40556
D202	6.5V Zener 1N823	40554
D203	7.5V Zener 1N4737	41028
LAMPS		
DS101	Cartridge 18 Volt 40 ma	40414
RESISTORS		
R101	10K ohm ½W Pot	40667
R102	120K ohm ½W 10%	40441
R103	18K ohm ½W 10%	40188
R104	18K ohm ½W 10%	40188
R105	10K phm ½W 10%	40186
R106	2.2K ohm ½W 10%	40199
R107	5.6K ohm ½W 10%	40433
R108	6.2K ohm ½W 5%	40436
R109	4.7 Megohm ½W 10%	40444
R110	18K ohm 1W 10%	40437
R111	560 ohm ½W 5%	40427
R112	1K ohm Trim Pot ¼W 5%	40447

SECTION 5

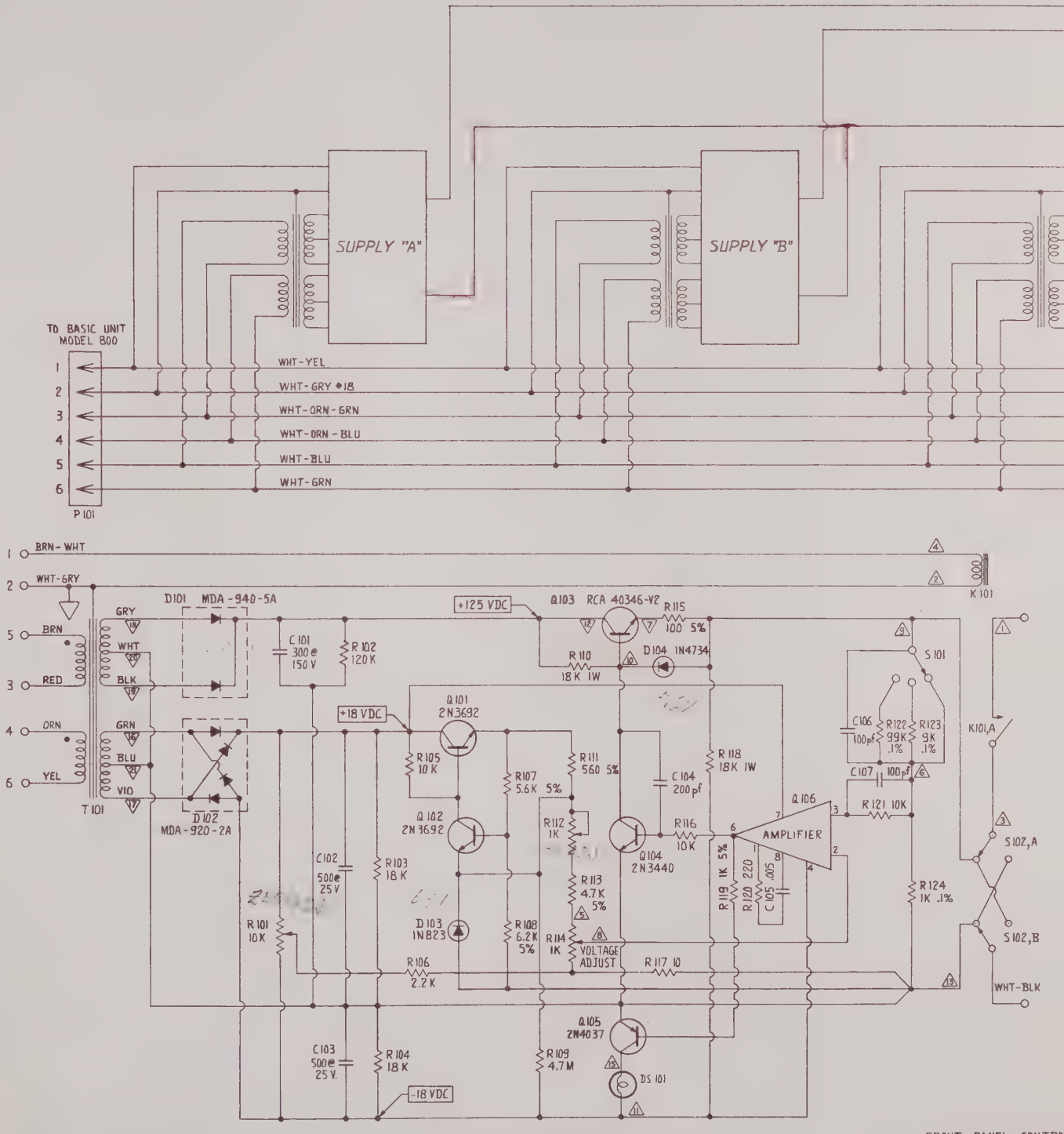
PARTS LIST (continued)

REFERENCE	DESCRIPTION	PART NO.
R113	4.7K ohm ½W 5%	40432
R114	Precision 10 turn 1K Pot	40448
R115	100 ohm ½W 5%	40424
R116	10K ohm ½W 10%	40186
R117	10 ohm ½W 10%	40162
R118	18K ohm 1W 10%	40437
R119	1K ohm ½W 10%	40426
R120	220 ohm ½W 10%	40172
R121	1K ohm ½W 10%	40426
R122	99K ohm ½W 0.1%	40328
R123	9K ohm ½W 0.1%	40329
R124	1K ohm ½W 0.1%	40331
R201	10K ohm ½W Pot	40667
R202	18K ohm ½W 10%	40188
R203	18K ohm ½W 10%	40188
R204	10K ohm ½W 10%	40186
R205	2.2K ohm ½W 10%	40199
R206	5.6K ohm ½W 5%	40433
R207	6.2K ohm ½W 5%	40436
R208	820 ohm ½W 10%	40178
R209	560 ohm ½W 5%	40427
R210	1K ohm Trim Pot ¼W 5%	40447
R211	4.7K ohm ½W 5%	40432
R212	Precision 10 turn 1K Pot	40448
R213	4.7 Megohm ½W 10%	40444
R214	10K ohm ½W 10%	40186
R215	10 ohm ½W 10%	40162
R216	4.7K ohm ½W 5%	40432
R217	1.5K ohm ½W 10%	40431
R218	1K ohm ½W 10%	40426
R219	10 ohm ½W 0.1%	40332
R220	100 ohm ½W 0.1%	40333
R221	1K ohm ½W 0.1%	40331
R222	10K ohm ½W 0.1%	40330
R223	1K ohm ½W 10%	40426
SWITCHES		
S101	Range Rotary, 1P 3 Pos.	40915
S102	Polarity, DPDT Non-Short	40569
S201	Range Rotary, 1P 4 Pos.	40916
S202	Polarity, DPDT Shorting	40568

SECTION 5

PARTS LIST (continued)

REFERENCE	DESCRIPTION	PART NO.
RELAYS		
K101	Reed Normally Open	40422
K201	Reed Normally Closed	40423
TRANSFORMERS		
T101	Power	40905
T102	Power, Triple Box Shielded	40906
TRANSISTORS/INTEGRATED CIRCUITS		
Q101	NPN 2N3692	40562
Q102	NPN 2N3692	40562
Q103	NPN RCA 40346-V2	41051
Q104	NPN 2N3440	40561
Q105	PNP 2N4037	41035
Q106	Operational Amplifier	41034
Q201	NPN 2N3692	40562
Q202	NPN 2N3692	40562
Q203	NPN 2N3440	40561
Q204	NPN 2N3440	40561
Q205	Operational Amplifier	41034
FIELD REPLACEMENT SPARES KIT		20033
1	40412 Dial Mechanism	
5	40414 Pilot Lamp- Cartridge 18V 40ma	
ISOLATED SERVICE SPARES KIT		20034
1	40412 Dial Mechanism	
5	40414 Pilot Lamp,Cartridge 18V 40ma	
1	40448 Precision Variable Resistor 1K ohm	
1	30004 Rotary Switch, Voltage Range	
1	30005 Rotary Switch, Current Range	
1	30006 PC Board, Voltage	
1	30007 PC Board, Current	
1	40905 Power Transformer	
1	40906 Power Transformer	



VOLTAGE POWER SUPPLY "A,B,C & D"

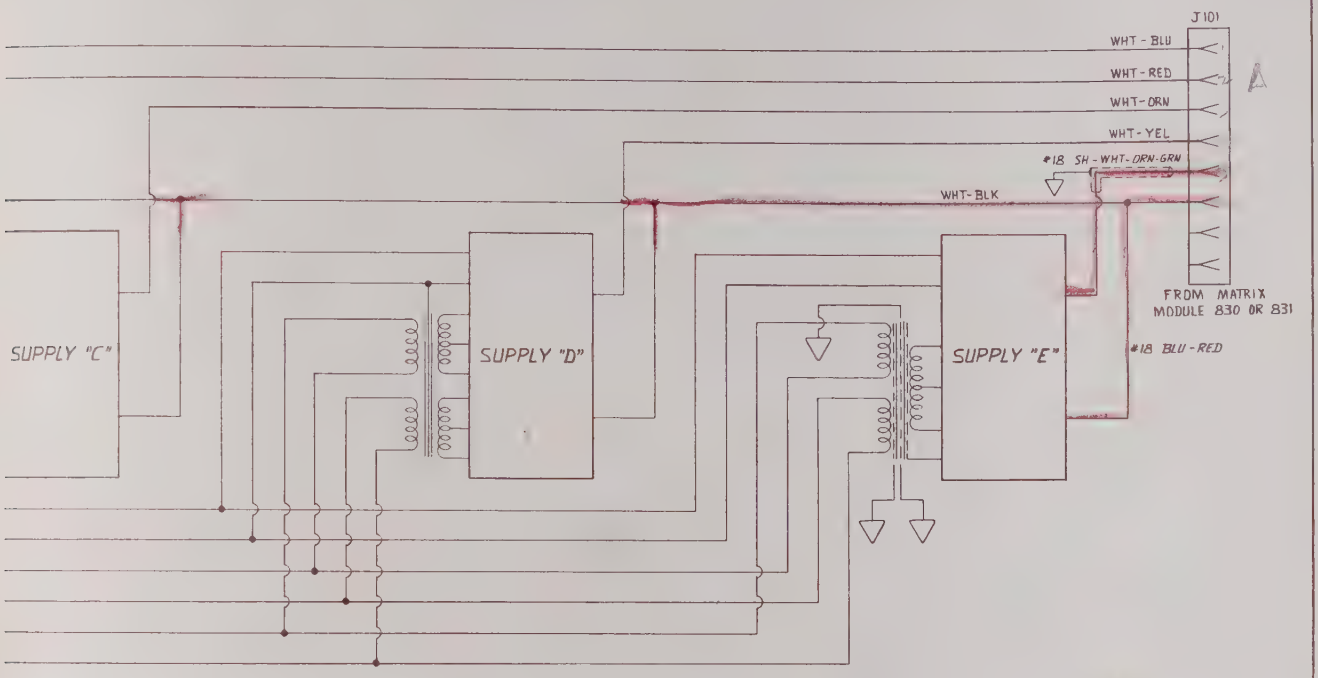
NOTES: UNLESS OTHERWISE SPECIFIED.

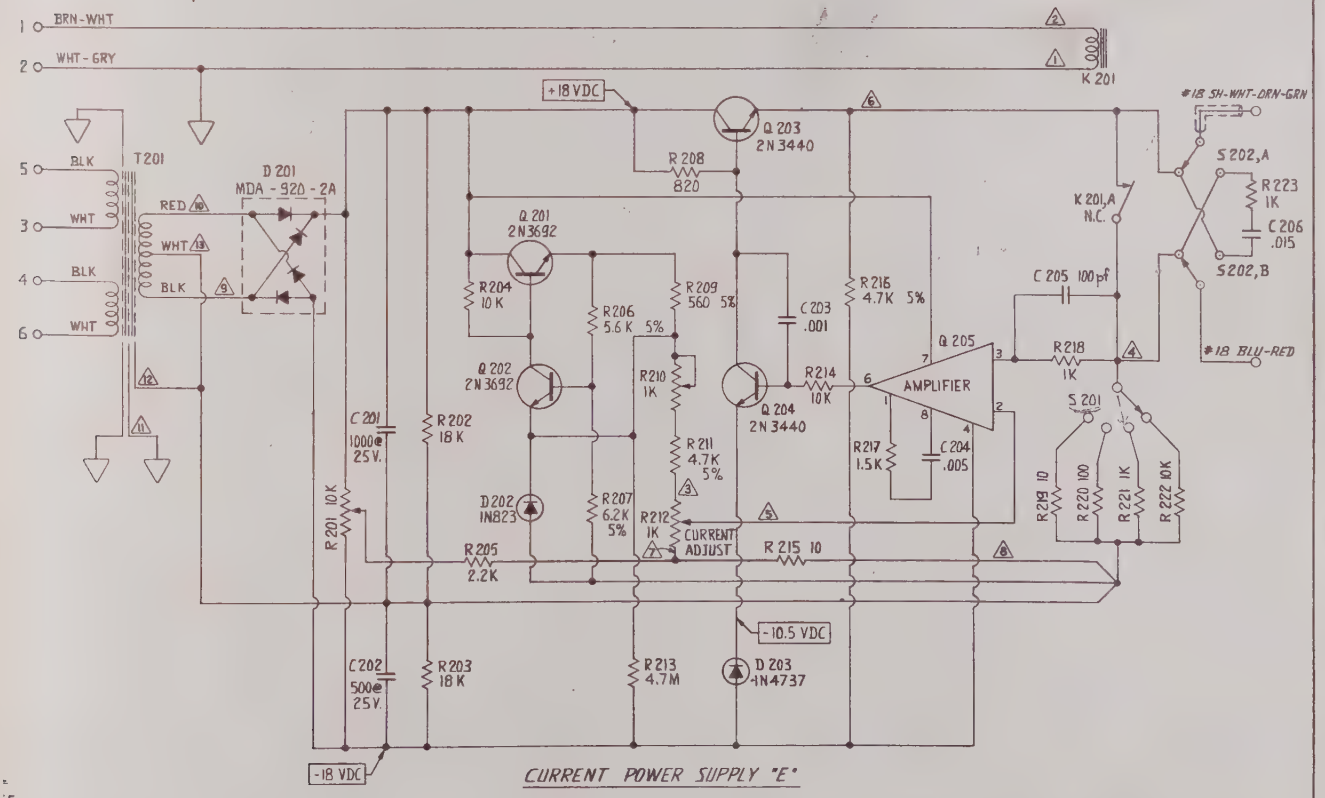
1. RESISTORS, ½W., 10% CARBON.
2. ALL RESISTANCES IN OHMS
3. ALL CAPACITANCES IN μfd.
4. ROTARY SWITCHES SHOWN IN MOST CCW POSITION.
5. SHIELDS GROUNDED.
6. P.C. BOARD TERMINALS ARE SHOWN △
7. LAST NUMBERS ARE R124; C107; R223 & C206

FRONT PANEL CONTRO

S 101 OUTPUT VOLTAGE RA
S 102 POLARITY SWITCH
R 114 VOLTAGE ADJUST
DS 101 WARNING LAMP (CU

S 201 OUTPUT CURRENT RA
S 202 POLARITY SWITCH
R 212 CURRENT ADJUST.





CURRENT POWER SUPPLY "E"

ENT LIMITING]

THE BIRTCHER CORP. —— INSTRUMENT DIVISION			
SCHEMATIC POWER SUPPLY MODULE 826			
DRAWN: E. Bodeman	APP'D: RLM	DWG. NO. D1271	REV.
DATE: 12-14-66	DATE: 12-1-66		

WARRANTY

All our products are warranted against defects in materials and workmanship for one year from the date of shipment. Our obligation is limited to repairing or replacing parts which prove to be defective during the warranty period. We are not liable for consequential damage.

For assistance of any kind, including help with instruments under warranty, contact your authorized Birtcher sales representative for instructions. Give full details of the difficulty and include the instrument model and serial number. Service data or shipping instructions will be promptly sent to you. There will be no charge for repair of instruments under warranty, except transportation charges. Estimates of charges for non-warranty or other service work will always be supplied if requested before work begins.

MODEL 830/831

CROSSBAR MATRIX

TABLE OF CONTENTS

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	Introduction	1
	Specifications	1
2	OPERATION	
	Installation	2
	Function of Controls	2
3	PARTS LIST	5
4	SCHEMATIC	6

Unit Serial Number_____

SECTION 1

GENERAL DESCRIPTION

INTRODUCTION

The 830/831 Matrix Module is used with the Model 800 component test system to provide quick, convenient means of inner-connection of bias, signal and measurement circuitry for testing multiple lead components such as integrated circuits. The Model 830 and 831 differ on in the number of device leads that can be connected; these are available for 20 or 40 leads respectively.

The Matrix Module contains a crossbar switch. Random or sequential input or measuring line is provided for by a set of pushbuttons.

SPECIFICATIONS

Power Supply Inputs: 5

Measuring External Inputs: 5

Outputs: Model 830 - 20 Model 831 - 40

Size: 5¾" high x 19" standard rack panel 4" deep

Construction: Anodized aluminum panel and chassis with silk screen panel markings.

Weight: Model 830 - 7 pounds
Model 831 - 9 pounds

SECTION 2

OPERATION

INSTALLATION

1. Remove the back cover of the Model 800. Install the Matrix Module at the bottom of the panel opening.

2. Insert the 8-pin power cable connector into the power supply.

3. Insert the 12-pin readout connector into the Readout Module.

4. Insert 12-pin cable from readout into matrix readout socket.

NOTE: If readout is not used, insert readout cable connector into the adjacent "readout" socket on the matrix.

5. Install test adapter socket in Model 800 Basic Unit test socket opening. Pin 1 is bottom left contact.

6. Connect ground wire to 800 ground lug (located on bottom of capacitor mounting bracket).

FUNCTION OF CONTROLS AND BINDING POSTS

External Line Binding Posts

Located on left of Matrix panel for connection of external signal and measuring equipment. Extreme left row is input connection to Matrix lines V thru Z. Right row is connected to common.

Internal Supply Binding Posts

Located on center left of Matrix panel. Provides access to power supply outputs. Left row of binding posts are from supply, right row connect to crossbar matrix lines A thru E.

Crossbar Matrix Switch

10 x 20 or 10 x 40 Matrix slide switch allows interconnection of any matrix input to device leads.

The horizontal portion of the crossbar is numbered from 1 thru 20 (or 40) and each number refers to a lead of the IC under test. The vertical portion of the crossbar determines the CONNECTION to that particular lead. Thus, any lead can be connected to any of the five power supplies (A, B, C, D), four external lines (V, W, X, Y), COMMON, or OFF.

Line "Z" Pushbuttons

20 x 40 pushbuttons. Transfers connection of device lead from crossbar matrix to line "Z" Binding Post when depressed. These are used to change signal or measuring connections without matrix programming.

Connection of External Equipment

External oscilloscope, voltmeter, signal sources, loads, etc., may be connected to the device under test by use of Matrix lines V thru Z. By removal of Power Supply shorting clips, the right set of Power Supply Binding Posts may be used where additional input lines are required. High frequency and pulse inputs may be connected directly to the Matrix lines X, Y and Z thru the "PULSE GENERATOR" connector located on the rear of the 830/831 Matrix. Use of this connection eliminates Readout wiring capacitance. Inputs should be connected as shown in Figure 2.

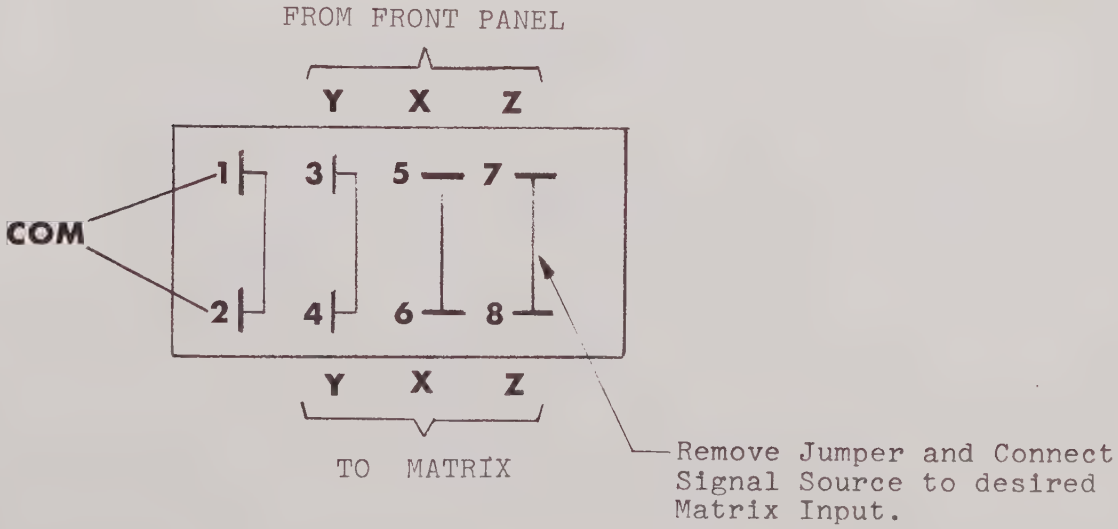


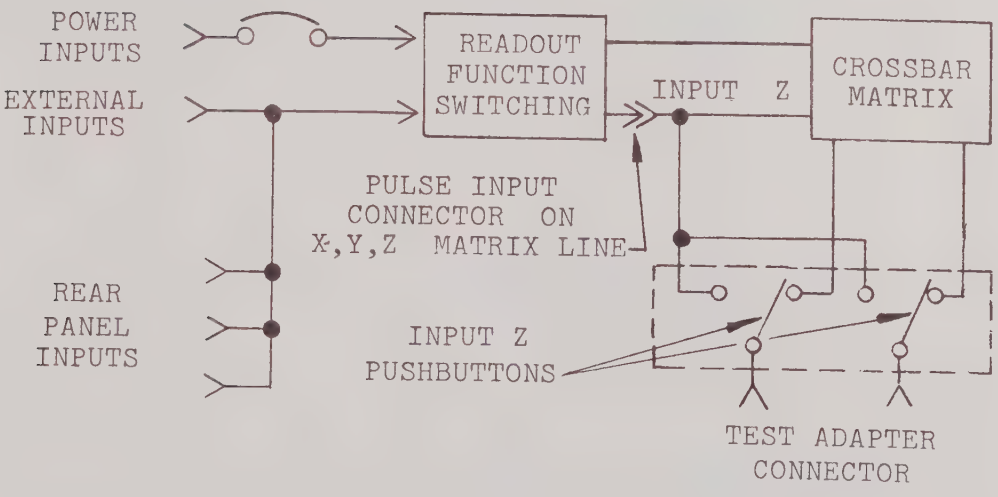
FIGURE 2

Test Programming

Set crossbar matrix switch levers for connection of device leads to desired matrix input lines.

Sequencing of inputs or measurement may be made by use of Line "Z" pushbuttons, as follows:

1. Connect Line "Z" to signal and measuring circuitry to be connected to device lead.
2. Set Matrix switch for normal connection of device leads.(This may be a supply voltage, off common, etc.).
3. Depress Line "Z" pushbutton corresponding to device lead to transfer connection of device lead from matrix connection to Line "Z" Binding Post.



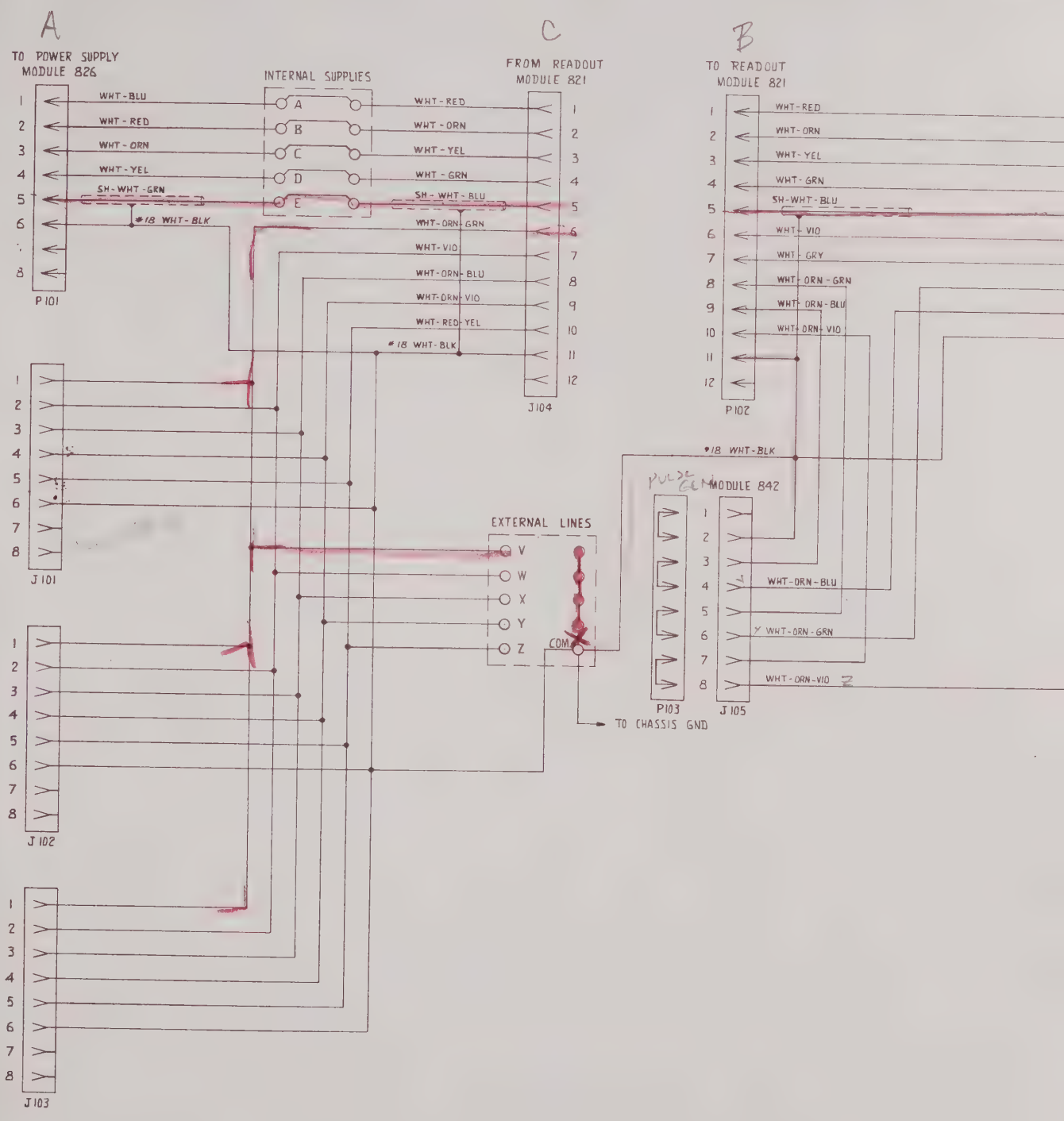
SECTION 3

PARTS LIST

REFERENCE	DESCRIPTION	PART NO.
SWITCHES		
S100	Crossbar Matrix Switch 10x20	40574
S200	Crossbar Matrix Switch 10x20	40575
S101 thru S120	Pushbutton Switches, Model 830	40570
S201 thru S240	Pushbutton Switches, Model 831	40570
CONNECTORS		
P101	Connector, 8-Pin Male	40403
P102	Connector, 12-Pin Male	40404
P103	Connector, 8-Pin Male	40403
J101	Connector, 8-Pin Female	40402
J102	Connector, 8-Pin Female	40402
J103	Connector, 8-Pin Female	40402
J104	Connector, 12-Pin Female	40405
J105	Connector, 8-Pin Female	40402
J106	Connector, 50-Pin Female	40506
J107 thru J127	Binding Posts	41056

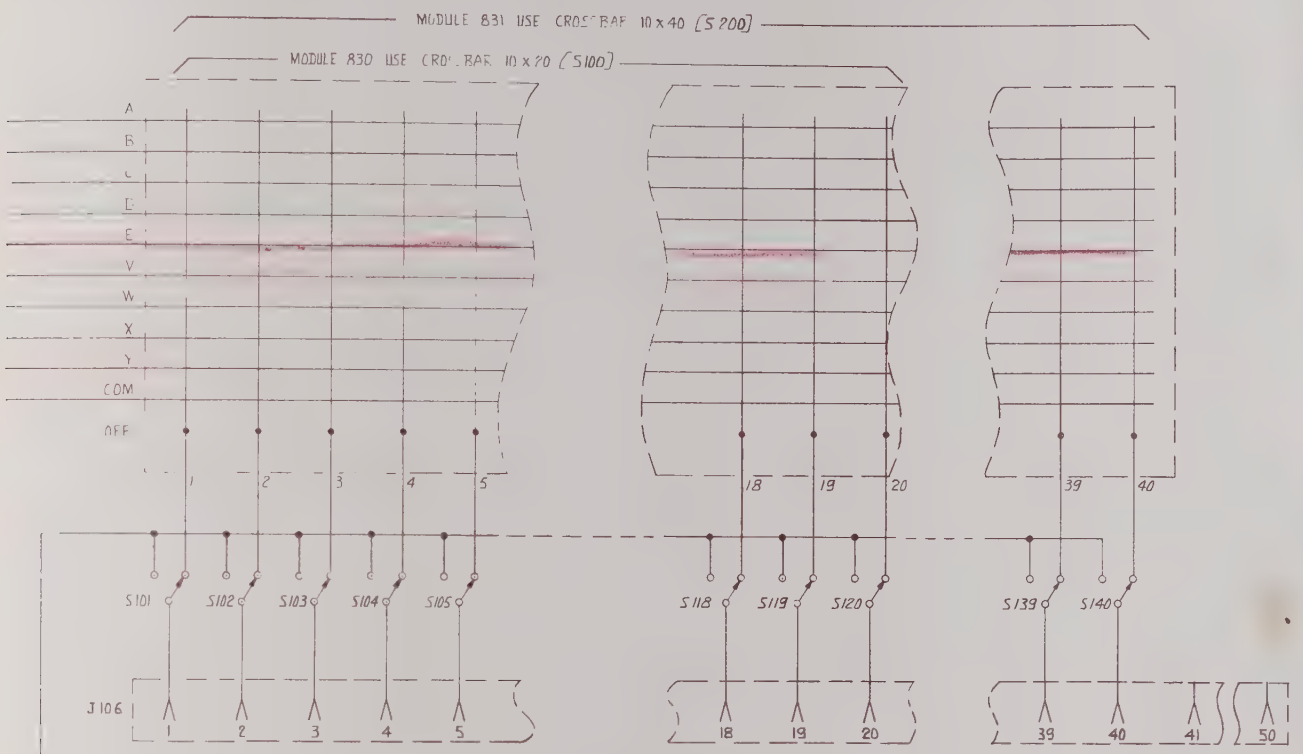
SPARE PARTS

Not Recommended



2. LINE "Z" PUSHBUTTONS SHOWN IN "NORMAL" POSITION.
1. CROSSBAR SWITCH SHOWN WITH SWITCHES IN "OFF" POSITION

NOTES: UNLESS OTHERWISE SPECIFIED.



TEST ADAPTER SOCKET

THE BIRTCHER CORP. — INSTRUMENT DIVISION			
SCHEMATIC MATRIX 10 x 20 OR 10 x 40 MODULE 830 OR 831			
DRAWN: E. Bodeman. DATE: 12-14-66	APP'D: KLM DATE: 12-1-66	DWG. NO. D1272	REV.

WARRANTY

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